Ionad Naisiunta Faire Galair

NDSC

EPI-INSIGHT

DISEASE SURVEILLANCE REPORT OF NDSC, IRELAND

ISSN: 1393-9548

Volume 6, Issue 1, January 2005

In Partnership for Prevention and Protection

Contents:

NDSC

National Disease Surveillance Centre,

25-27 Middle Gardiner St
Dublin 1
Ireland

Tel: +353 (0)1 **876 5300**
Fax: +353 (0)1 **856 1299**
info@ndsc.ie
www.ndsc.ie

Polio Eradication and Acute Flaccid Paralysis Surveillance

Since 1988, when the World Health Assembly resolved to eradicate polio, the number of polio cases worldwide has decreased from 350,000 to fewer than 800 cases in 2003. This was achieved through high vaccination coverage, augmented by quality surveillance for acute flaccid paralysis (AFP) and mop-up vaccination campaigns. Although the European region was certified "polio- free" in 2002, as long as wild polio continues to circulate in other parts of the world, Ireland is at risk of polio importation.[1 2 3]

Vaccination is key to the success of polio eradication. In Ireland, we use inactivated polio vaccine (IPV) as part of the routine childhood immunisation programme. Uptake of three doses of IPV_3 for Quarter 2, 2004 was 82% and 89% for 12 and 24 month old children respectively.[4] Exclusive use of IPV in immunisation against poliomyelitis requires the vaccination coverage to be very high, preferably above 95%, to overcome any concern about limited herd immunity.[1]

AFP Surveillance

The surveillance of acute flaccid paralysis (AFP) is the detection of flaccid paralysis of new onset in children under 15 years (and any suspected poliomyelitis case in a person of any age), with prompt virological testing to disprove or confirm poliovirus infection. AFP surveillance can promptly identify poliovirus circulation if it is occurring, and also provides certification-quality evidence that wild poliovirus transmission is not occurring.

AFP occurs in about 1% of polio cases. AFP is also caused by non-polio viruses e.g. other enteroviruses such as echoviruses, and coxsackieviruses. AFP surveillance systems are in place world-wide to ensure rapid identification and investigation of any potential polio case.

High quality AFP surveillance requires:

- The ability to detect at least one case per year of non-polio AFP for every 100,000 children under 15 years of age.
- Two adequate stool specimens collected from at least 80% of cases of AFP.
- That all stool specimens should be processed at the National Virus Reference Laboratory (NVRL), the WHO accredited laboratory in Ireland.

In Ireland, although hospitals from all health boards participate in the AFP surveillance scheme, the current AFP surveillance fails to meet the WHO criteria for a high quality surveillance system (table 1).

Table 1. WHO recommended standards for AFP surveillance and Irish performance

	2003	
WHO target criteria	**WHO target in Ireland**	**Ireland's performance**
Ability to detect at least one non-polio AFP case /100,000 children < 15 years of age*	8 AFP cases expected (1/100,000)	3 AFP† cases reported (0.37/100,000)
Two adequate specimens collected from at least 80% of AFP cases**	2 specimens from 80% cases	2 specimens from 66% AFP cases
All specimens processed in WHO accredited lab	All specimens processed in NVRL	100% specimens processed in NVRL

** Expected non-polio AFP rate*
† The final classification of all three cases was Guillain-Barré syndrome.
*** At least 24 hours apart within 14 days of onset of paralysis, adequately shipped to the laboratory*

Summary

Polio continues to be reported in a number of regions throughout the world. Until polio eradication has been globally achieved polio virus could be imported into Ireland. Currently, AFP surveillance in Ireland is inadequate (0.37/100,000 population among children < 15 years of age) and does not meet WHO standards.

Ensuring high quality AFP surveillance and high IPV vaccination rates are necessary to maintain polio-free status, to rapidly identify importation of polio cases and respond quickly in the event that polio importation does occur.

All physicians are encouraged to:

- **Report all cases of AFP among children < 15 years of age.**
- **Submit at least two stool samples to the NVRL (at least 24 hours apart within 14 days of onset of paralysis).**
- **Encourage polio immunisation.**

Suzanne Cotter, NDSC, Grainne Tuite, NVRL

References

1. Hovi T, Wassilak S. The importance of maintaining high coverage polio vaccination beyond global eradication of wild type poliomyelitis. *Eurosurveillance Wkly* [Serial online] 2004 [cited, 22 January 2004] **8**(4). Available at http://www.eurosurveillance.org/ew/2004/040122.asp - 6
2. WHO. Continued surveillance for acute flaccid paralysis. Available at http://www.euro.who.int/vaccine/20030724_10
3. WHO. Introduction of inactivated poliovirus vaccine into oral poliovirus vaccine-using countries. *Weekly Epidemiological Record (WER)* 2003; **78**(28): 241-252. Available at http://www.who.int/wer/2003/wer7828/en/
4. NDSC. Immunisation uptake report for Ireland, Q2-2004. Available at http://www.ndsc.ie/Publications/Immunisation/ImmunisationUptakeQuarterlyReports/d1136.PDF

Epidemiology of Human Salmonellosis in Ireland, 2003

Introduction

Salmonella is a bacterial zoonotic pathogen that is a relatively common cause of foodborne illness in Ireland and worldwide. At present there are over 2,500 known serovars of salmonella. In recent years, two serotypes, namely, *S. enterica* serotype Enteritidis and *S. enterica* serotype Typhimurium have accounted for the majority of cases of human salmonellosis.

Salmonellosis presents as an acute enterocolitis, with sudden onset of headache, abdominal pain, diarrhoea, nausea and occasionally vomiting. Fever is almost always present. Dehydration, especially amongst vulnerable populations such as infants, the immunocompromised and the elderly, may be severe. *S.* Typhi and *S.* Paratyphi can cause enteric fever, a severe systemic life threatening condition. This condition remains uncommon in Ireland and is mainly associated with travel to endemic areas. A wide range of domestic and wild animals, as well as humans can act as the reservoir for this pathogen, although chronic carriage is rare in humans. Prevention, surveillance and control of salmonella infection is of major public health importance. Measures have been implemented from farm to fork in an attempt to control spread of this zoonotic agent.

Materials and Methods

The National Salmonella Reference Laboratory (NSRL) was established in 2000 in the Department of Medical Microbiology, University College Hospital, Galway. This laboratory accepts *S. enterica* isolates from all clinical and food laboratories for serotyping, phage typing and antimicrobial sensitivity testing. This report reviews data available from the NSRL and weekly clinical notifications for the year 2003. These data enable us to provide an overview of the epidemiology and burden of laboratory confirmed salmonellosis in Ireland. However, it is widely accepted that laboratory-confirmed cases of salmonellosis represent a small minority of all human cases and that cases of diarrhoea associated with travel, those associated with more severe symptoms and those in children may be over-represented in the laboratory data.

Results

NSRL data

Demographic information

There were 486 clinical isolates of *S. enterica* referred to NSRL in 2003. The male: female ratio was 1:1. The highest number of cases was in children under five years of age. However, when age-specific incidence rates are calculated (figure 1), the burden of illness in this age group is even more evident.

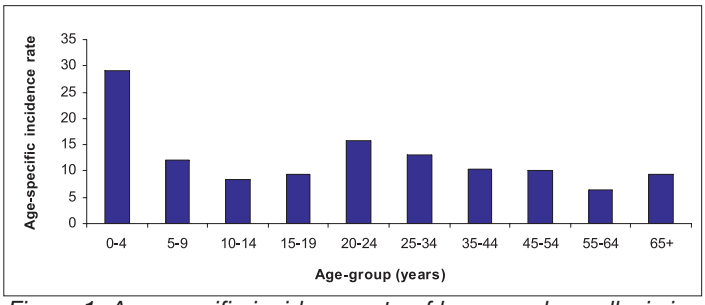

Figure 1. Age-specific incidence rate of human salmonellosis in Ireland, 2003

Seasonality

There was a marked seasonal pattern seen in the number of clinical salmonellosis cases reported through the weekly notification system in 2003, with a sharp peak seen in week number 36.

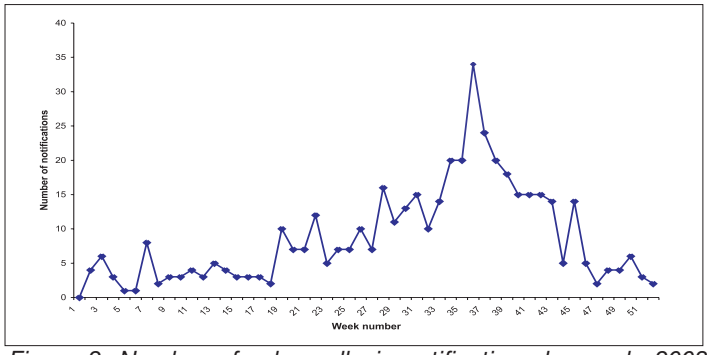

Figure 2. Number of salmonellosis notifications by week, 2003 (NDSC)

Serotyping

The predominant serovar causing human illness was *S*. Enteritidis (42% of isolates) followed by *S*. Typhimurium (28%). Table 1 demonstrates the shift between these two serotypes in the past number of years. The next most commonly isolated serotypes in 2003 were *S*. Hadar (n=21), *S.* Virchow (n=10) and *S*. Kentucky (n=10). There were nine cases of *S*. Typhi detected in 2003, which is an increase on 2002 when there were five cases reported.

Table 1. Serotypes of S. enterica referred to NSRL (1998-2003)

Serotype	1998 No. (%)	1999 No. (%)	2000 No. (%)	2001 No. (%)	2002 No. (%)	2003 No. (%)
S. Enteritidis	60(8)	155(33)	239(36)	248(46)	165(40)	205(42)
S. Typhimurium	578(80)	200(42)	286(43)	165(30)	140(34)	135(28)
S. Bredeney	15(2)	55(12)	24(4)	11(2)	2(0.5)	3(1)
S. Kentucky	14(2)	12(3)	15(3)	4(1)	1(0.2)	10(2)
All other serotypes	54(7)	52(11)	101(15)	115(21)	108(26)	133(27)
Total	**721**	**474**	**665**	**543**	**416**	**486**

Phage typing

The incidence of *S*. Typhimurium DT104b has increased in recent years and it represented 50% of all Typhimurium isolates tested in NSRL in 2003.

PT4 has been the predominant phage type in Enteritidis isolates since 1998 (comprised 28% of all Enteritidis isolates in 2003). However, the incidence of PT1 is on the increase (representing 26% of all Enteritidis isolates in 2003).

Table 2. Antimicrobial susceptibilities of human Salmonella enterica serotypes isolated in Ireland, in 2003.

	% Resistance						
Serotype (number)	Amp	Chl	Strep	Sulph	Tet	Trim	Nal
S. Enteritidis (205)	8	0	3	4	4	1	33
S. Typhimurium (135)	77	58	66	79	76	21	3
S. Hadar (21)	81	0	95	0	81	0	100
S. Virchow (10)	30	0	0	30	2	20	90
S. Kentucky (10)	50	10	50	60	5	20	70
S. Typhi (9)	11	11	11	11	11	11	44
S. Dublin (5)	0	0	0	0	0	0	0
S. Stanley (4)	25	25	50	50	50	0	25
S. Bredeney (3)	33	0	0	33	0	0	0

Amp = Ampicillin, Chl = Chloramphenicol, Strep = Streptomycin, Sulph = Sulphonamide, Tet = Tetracycline, Trim = Trimethoprim, Nal = Naladixic acid

Travel-association

There were 72 isolates (14.8%) reported to NSRL in 2003 associated with travel outside of Ireland. The majority of these cases were associated with travel to Spain (n=26). The next most common countries reported were Portugal (n=6) and Thailand (n=6), followed by Pakistan (n=5), India (n=3) and the UK (n=3). Six of the nine isolates of *S*. Typhi received by NSRL in 2003 were reported to be travel-associated. Three of these were associated with travel to Pakistan; two with travel to India and one was

unknown. It is likely that recent travel is not always reported in relation to isolates submitted to NSRL.

Antimicrobial resistance

The antimicrobial susceptibility patterns of the most commonly isolated serotypes in 2003 are presented in table 2. The same trend that was noted in previous years with high levels of resistance found amongst *S*. Typhimurium isolates, particularly *S*. Typhimurium DT104 was again found in the 2003 data. Many of these isolates were found to have the penta resistance phenotype (ACSSuT) that was also reported in previous years.

Clinical notification data

Salmonellosis is a notifiable disease. Medical practitioners have a statutory obligation to report all suspected cases. Information on trends in salmonellosis notifications shows that the crude incidence rate rose in the 1990s to peak in 1998, decreased until 2002 but an increase was again seen in 2003 (figure 3). The total number of notifications in 2003 was 449.

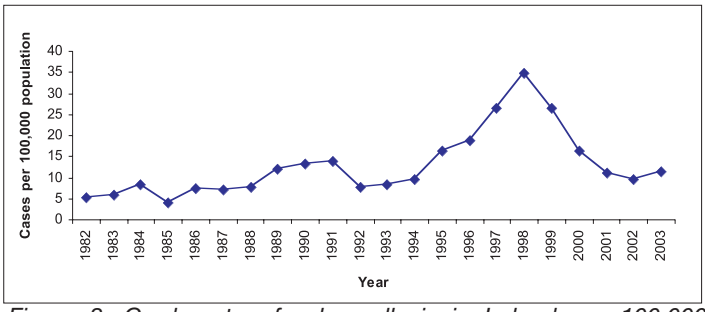

Figure 3. Crude rate of salmonellosis in Ireland per 100,000 population, 1982-2003

Outbreaks

There were eight outbreaks of salmonellosis reported to NDSC in 2003; four were identified as *S*. Enteritidis, and there was one each of *S*. Typhimurium, *S.* Hadar, *S*. Kentucky, and *S.* Rissen. There were three general outbreaks (all associated with restaurants) and five family outbreaks. The numbers ill in the general outbreaks ranged from six to eleven persons (*unpublished NDSC data*).

Discussion

The significant burden of human illness caused by *Salmonella enterica* is evident from the data presented in this review of the epidemiology of salmonellosis in Ireland in 2003. Of particular note is that the incidence of human salmonellosis in Ireland was seen to increase in 2003 (CIR 11.5 per 100,000 population) for the first time since 1998. The highest incidence was reported in the North-Western Health Board region. Higher rates were seen for the same period in Northern Ireland[1] (12.4), England and Wales[2] (28.3) and Scotland[3] (24.8). These differences should be interpreted with caution as criteria for submission of specimens for culture may vary and may account for some part of the apparent differences.

Similar trends regarding the epidemiology of this pathogen were noted in 2003 as in previous years. All age-groups were seen to be affected but the highest incidence was again noted in children under five years of age. It is likely that more specimens are submitted for testing from this age-group, so this should be borne in mind when interpreting these data. Males and females were equally affected.

Salmonella has a well characterised seasonal distribution and a sharp rise in cases was noted in week 36 in 2003. A Europe-wide study has been undertaken by the WHO European Centre for Environment and Health (ECEH) to examine the effects of global climate change on a number of gastroenteric pathogens including *Salmonella* sp. The first results from this study examining the effect of temperature on the incidence of salmonellosis were published in 2004.[4]

The detailed typing methods being employed by the NSRL are dramatically improving our ability to monitor epidemiological trends, identify clusters and outbreaks, and assist in trace back through the food chain. Analyses of the serotyping results revealed that in 2003, *S*. Enteritidis remained the predominant serotype, followed by *S*. Typhimurium. These two serotypes represent 70% of the total salmonellas affecting humans. A diverse number of other serotypes comprise the remaining 30% of human isolates, with forty-five serotypes other than Enteritidis or Typhimurium detected by NSRL in 2003. Phage typing provides an additional level of sub-typing detail. The trends in Enteritidis and Typhimurium isolates are particularly interesting. DT104b has taken over from DT104 as the predominant Typhimurium phage type in humans. A decrease has been seen in *S*. Enteritidis PT4 across Europe in recent years.[5] In Ireland, *S*. Enteritidis PT4 decreased from 85% of all Enteritidis isolates in 1998 to 28% in 2003. A corresponding increase has been seen of PT1, which comprised 26% of Enteritidis isolates in 2003.[6]

When the AMR (antimicrobial resistance) patterns of the various salmonella serovars were examined, the trend that has been reported over the past number of years of high levels of resistance among *S*. Typhimurium DT104 isolates, was again seen in 2003. This continues to be cause for concern.

In 2003, the use of the Enter-net network (an international surveillance network for human gastrointestinal infections) proved to be extremely beneficial for sharing knowledge and expertise in the area of surveillance and control of gastrointestinal disease, and as a particularly efficient alert system to aid in the investigation of clusters and epidemics of salmonella and VTEC *E. coli*.

Finally, analyses of the 2003 data reveal that it is becoming evident that an increasing number of cases of illness of salmonellosis are linked to travel outside of Ireland, with 15% of cases in 2003 being reported as travel-associated. The majority of cases were associated with travel to Spain but this country is also one of the most popular tourist destinations for Irish people. It is quite likely that many of the 'unusual' serotypes that we are seeing each year are acquired abroad. Of particular note in 2003 was the increase in the number of typhoid cases seen (n=9) compared to five isolates in 2002. This highlights the need for reinforcing awareness amongst travellers to endemic countries.

It is evident from the data presented in this review that salmonella continues to be an extremely significant public health problem, and especially in light of the increase in cases seen in 2003, control measures must be enforced throughout the food chain to help to reduce this burden of disease.

Barbara Foley and Paul McKeown, NDSC;
Martin Cormican, NSRL

References

1. Communicable Disease Surveillance Centre - Northern Ireland. http://www.cdscni.org.uk/
2. Health Protection Agency – CDSC. http://www.hpa.org.uk/infections/topics_az/topics.asp?category=a
3. SCIEH. http://www.show.scot.nhs.uk/scieh/
4. Kovats R. S., Edwards S. J., Hajat S., Armstrong B.G., Ebi K.L., Menne B., and The Collaborating Group. The effect of temperature on food poisoning: a time-series analysis of salmonellosis in ten European countries. *Epidemiol Infect* (2004) **132**: 443-453.
5. Enter-net website. http://www.hpa.org.uk/hpa/inter/enter-net_menu.htm
6. O'Hare C, Doran G, Delappe N, Morris D, Buckley V, Corbett-Feeney G, McKeown P, Anderson W, Cormican M. Antimicrobial resistance and phage types of human and non-human Salmonella enterica isolates in Ireland, 1998-2003. *Commun Dis Public Health* (2004) **3**:193-9.

Acknowledgements

We wish to thank the staff of the National Salmonella Reference Laboratory, UCHG for providing the data for this report and also the clinical and food microbiology laboratories that send *Salmonella* isolates to NSRL for analysis. In addition, we would like to thank the Departments of Public Health and Community Care areas for providing the clinical notification data.

Legionnaires' Disease and Spa Pools

A recent study undertaken by the Health Protection Agency (HPA) in the UK has highlighted the risk of Legionnaires' disease associated with spa pools (Dr Surman-Lee, personal communication). One hundred and eight pools in 88 centres were surveyed. Twenty three pools (21%) were found to contain *Legionella* bacteria. Sixteen of these (70%) had passed current accepted levels for routine microbiological parameters. The *Legionella* counts ranged from 10 to 24,000 cfu/L. Five pools had counts >1000 cfu/L. Pool water treatment included chlorine (73%); chlorine and ozone (7%); bromine (19%); and bromine and ozone (1%). Over 63% of samples from pools treated with bromine compared to 26% of those treated with chlorine failed to meet the microbiological standards within the current UK guidelines.

Spa pools are increasingly used both in public and private settings. Large outbreaks of Legionnaires' disease have been linked to spa pools.[1 2] They pose a significant risk for infection with *Legionella* bacteria because:

- Spa pool users do not follow the advice to shower before using a spa pool so nutrients used by bacteria for growth e.g. dead skin, sweat and other body secretions, body lotions etc. make it difficult to maintain active levels of disinfectant.

- These nutrients together with the warm temperatures of the water encourage the growth of bacteria including *Legionella*.

- The design and installation of many spa pools make access to all parts of the system for thorough cleansing and disinfecting difficult.

The study highlighted the problem of many instances of poor management and maintenance of spa pools. The Health and Safety Executive and the HPA in the UK hope to publish joint guidelines on controlling the risk of *Legionella* associated with using spa pools in Spring 2005. The HSE interim guidelines are available at www.hse.gov.uk/pubns/spalegion.pdf

References
1. Den Boer JW *et al*. A large outbreak of Legionnaires' disease at a flower show, the Netherlands, 1999. Available at www.cdc.gov/ncidod/eid/vol8no1/01-0176.htm
2. De Schrijver K *et al*. An outbreak of Legionnaires' disease among visitors to a fair in Belgium, 1999. Available at www.eurosurveillance.org/em/v05n11/0511-221.asp

Imported Lassa Fever Case in U.S.A

Lassa fever is an acute viral illness thought to occur in all of West Africa. It is one of a group of illnesses that comes under the term viral haemorrhagic fevers. It is contracted by exposure to infected rats. It can also pass from person to person from infected bodily fluids, or through airborne droplets from coughs and sneezes.

In August 2004, a 38 year old American returning from a trip to Liberia died in New Jersey. It was the first Lassa fever case in the USA for 15 years. Imported cases from West Africa have also been reported in Europe.

Clinical Features
Symptoms of Lassa fever typically occur 1-3 weeks after exposure. These include fever, retrosternal pain, sore throat, back pain, cough, abdominal pain, vomiting, diarrhoea, conjunctivitis, facial swelling, proteinuria, and mucosal bleeding. Neurological problems have also been described (e.g. hearing loss, tremors, and encephalitis).

Approximately 15 – 20 % of patients hospitalised for Lassa fever die from the illness. However, approximately 80% of human infections with Lassa virus are mild or asymptomatic, and 1% of infections overall result in death.

Because the symptoms of Lassa fever are so varied and non-specific, clinical diagnosis is often difficult. Clinicians are reminded to consider the diagnosis of Lassa fever among travellers returned from West African countries where the illness is endemic.

Further information on the management of viral haemorrhagic fever in Ireland is available on the NDSC website at http://62.73.162.202/Publications/ViralHaemorrhagicFever/

Launch of Report of Waterborne Cryptosporidiosis Subcommittee

The Report of Waterborne Cryptosporidiosis Subcommittee was launched on 10th December 2004. The report was prepared by a multidisclipinary subcommittee of the Scientific Advisory Committee of the National Disease Surveillance Centre. Cryptosporidiosis is an important and common cause of human diarrhoeal illness, particularly in those who are immunocompromised. It can be transmitted via water that is contaminated with human or animal faeces. The report aims to inform and advise on the risk to public health from the detection of *Cryptosporidium* in drinking water and water used for recreational purposes; on what should be done to prevent water contamination with *Cryptosporidium*; and to provide public health guidelines on how to manage the situation when it is detected in water. The report is available on the NDSC website at www.ndsc.ie/Publications /Cryptosporidiosis/